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ABSTRACT

This report describes a 1989 leadership round-table discussion at the Roger Tory Peterson Institute in New York, which promotes emotional and intellectual linkages between people, especially children, to nature. The document includes the keynote remarks of three speakers along with some administrative guidelines for nature centers. Conservation teacher William Hammond's address deals with architectural considerations for facility construction, focusing on finding and working with an architect. Identifying the program's purpose, goals, and building requirements are key parts to the design process. It is also important to remember that different architects have different values. Mike Templeton, director of the National Science Foundation's Informal Science Education Program (ISE), offers tips on how to work with potential funding agencies. Templeton uses a simulation game to explain, in great detail, the process of communicating with local and federal foundations like ISE. Donald Cook, director of the Tiorati Workshop for Environmental Learning, describes the value of environmental education for children, with his New York workshop as an alternative-model nature center. The Tiorati work, meeting, and research areas are well-designed and equipped for environmental study. The center hosts day-long environmental education programs for elementary students, who set up their own research projects. At the same time, the center trains teachers to become independent learners themselves, cultivating them as leaders of children. The final sections of the report lists goals, guidelines, and evaluation criteria for nature-center architecture, funding, and educational programs. (TES)

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AMERICAN NATURE CENTERS

Guidelines for Leadership in the Nineties

Roger Tory Peterson Institute
of Natural History

RC018070

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AMERICAN NATURE CENTERS

Guidelines for Leadership in the Nineties

Proceedings of the 1989 Confab
sponsored by the

Roger Tory Peterson Institute
of Natural History

Paul A. Benke
Chairman of the Board of Trustees
Jeffrey B. Froke
President
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Director of Education Programs

Introduction

by Jeffrey B. Froke, President of RTPI

"We must set aside land and develop special places where attitudes can be shaped. The aim of nature centers is just that and I only wish we had many more of them." — Roger Tory Peterson

"... a vast network of nature centers and outdoor classrooms should be established..." where people "can learn by direct experience the essentials that underlie environmental quality." — Laurance Rockefeller

The Roger Tory Peterson Institute eagerly sought an opportunity to bring together and learn from a small group of America's leading nature center professionals. These people, and the hundreds more they represent, are doing some of the most exciting and essential work of our nation's conservation and environmental effort. They create and guide the direct connections of people, young and old, with the natural world. Reflecting on Dr. Peterson's role in the early development of American nature centers, we at RTPI felt that we needed to be a part of that work today.

Our institute seeks to promote the emotional and intellectual linkages of people, especially young children, to nature. We are dedicated to nurturing their appreciation and caring for wild places and wild things in a manner that will foster a lifetime commitment to the protection of nature. Nature centers provide the sites and facilities for this crucial bonding to take place. Nature centers are the training grounds for many of our finest young naturalists. They are invaluable.

Nature centers, public and private, have a potential for educational service far beyond that presently known and employed by our society. Communication among center managers, as well as to the public, is not what it could be. Collaboration among centers and partnerships with local school systems need greater levels of funding and program guidance than is presently available. Centers across the country, new and established, share so much in common, but seem to fall short in their ability to truly exchange and enjoy these commonalities.

This RTPI document on "American Nature Centers" represents the findings and recommendations of committed and knowledgeable practitioners who convened in western New York in 1989. The meeting was called to order, and this document was written with nature centers' professional and volunteer leaders in mind, with the aim of encouraging and bolstering their ongoing and important work. It is sent with best wishes for their continued success.

Our 1989 roundtable on the American Nature Center, and this publication of its guidelines, would not have been possible without the financial support of The Margaret L. Wendt Foundation and the American Conservation Association. It is my pleasure and honor to offer the trustees of these two organizations the gratitude of RTPI and all the nature centers across the country who may benefit from their generous support.

The Confab

According to Webster's, a confab is simply "an informal talk". It is the term we have chosen to denote a special series of small conferences involving 15 - 20 national leaders with expertise in nature education and other topics germane to our mission.

The confab on nature centers provided an opportunity for 19 invited representatives from successful nature education organizations around the country to define guidelines for practice in the management of a nature center. Their work centered on questions related to education, funding and architectural building programs.

The format of the confab centered on keynote addresses, facilitated small-group roundtable talks and work sessions where participants pooled their experience and drafted guidelines. In the pages that follow are the keynote remarks of our speakers and some management guidelines we hope nature center directors throughout the country will find useful.

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The Keynote Speakers

The speakers who were invited to the confab are all highly successful in their respective fields of endeavor. Their charge , on the other hand, was more to provoke discussion rather than to deliver the answers. Background information about the speakers and their thoughts they brought to the confab are contained in this section.

Donald Cook is Director of the Tiorati Workshop for Environmental Learning at Bank Street College of Education in New York, NY. He is a graduate of Grinnell College, Grinnell, IA and holds a Masters degree in Geography from Teachers College, Columbia University in New York, NY.

Mr. Cook has been with the Tiorati Workshop since 1984. Besides program administration, he is responsible for developing new curriculum materials and for preparing elementary school teachers to teach science. He teaches two courses: "Integrative Learning for Children in the Natural Environments" and "Science for Teachers." He is responsible for program development and fund raising and he is a consultant for professional development workshops in New York City metropolitan area schools.

Prior to joining Bank Street College , Mr. Cook had been an adjunct professor of Geography at Hunter College in New York and Project Coordinator of The Center for Human Environments in the City University of New York. He was also employed as Literature Analyst by the American Geographical Society and had been a teacher at the American School of Rio de Janerio, Brazil. Mr. Cook is author of several papers spanning the topics of education, the environment and geography.

William Hammond is widely recognized as a pioneer in applying modern learning theory to environmental studies. He was recommended to RTPI by the American Institute of Architects for whom he is a consultant.

Mr. Hammond was named National Wildlife Federation's 1988 Conservation Teacher of the Year. Through his position as coordinator of Florida's Lee County Schools' environmental education programs, he has developed environmental education materials and programs that have served as national models. Because of his expertise he frequently serves as consultant, facilitator, and proposal reviewer for the National Science Foundation.

Since 1968, Mr. Hammond has shared his knowledge by working as a consultant or speaker in 28 states: for the US Department of of Interior; U.S. Forest Service; U.S. Energy Office; the American Association for the Advancement of Science; the Canadian Federal Government; and in the provinces of British Columbia, Alberta, Ontario and New Brunswick. He has worked as consultant or speaker for more than 215 school systems, 20 state departments of education and 68 universities and colleges. He has also been an associate trainer in General Electric's applied Creative Thinking Institutes for middle and upper Fortune 500 management staff.

He is co-author of the highly acclaimed book *4MAT and Science: Toward Wholeness in Science Education.*

Michael Templeton is program Director of the National Science Foundation's Informal Science Education (ISE) Program located within the Science and Engineering Education Directorate. The ISE program is responsible for NSF's support of out-of-school education in science and mathematics for both children and general adult audiences. In FY 89 more than $15 million in awards were made.

Prior to joining NSF in 1986, Mr. Templeton served as Director of Science at the Pacific Science Center in Seattle, as Executive Director of the Association of Science-Technology Centers in Washington, D.C., and as Executive Director of the Oregon Museum of Science and Industry in Portland, Oregon. In earlier work as an engineer at Tektronix, Inc., he carried out research on advanced electron display devices and he holds a key patent on a high speed direct viewing storage oscilloscope.

Mr. Templeton received his B.S. in Mathematics from Portland State University and his M.S. in Physics from the University of Washington, where he completed advanced graduate study in theoretical physics. His long standing interest in science communications in museums and informal settings is reflected in board and advisory committee service for several national organizations and projects, extensive experience as a museum consultant and service on the editorial board of the Museum Studies Journal.

Learning by Design...Designing with Nature: Gaining an Architectural Perspective For the Nature Center

by Bill Hammond

What are the essential architectural considerations that those engaging in creating a Nature Center consider? The obvious questions that confront the pioneers venturing on such a journey often spill out as: What kind of facility do we need? Do we need an architect or can the building be done by a local contractor? Who knows an architect? Is there an architect who will donate his/her services to design us a very "special" facility? How do we estimate costs for the building? What is the best process for getting the kind of Nature Center facility we would really like to have?

The answers to these questions rest largely in the depth of commitment of the planning committee to balancing the long term perspective with the desire to get something started now. The "Three Little Pigs" story comes to mind as the appropriate analogy. The Nature Center Building(s) are generally the central investment a Nature Center Board will make. The design decisions will shape future program operations, financial obligations for ongoing maintenance costs, adaptability to changing priorities as program and community needs change. Perhaps the most important dimension to the architectural decisions surrounding the facility is that they make a lasting and profound statement of the founders' philosophy and sensitivity to Nature. Placing buildings on the site makes a long term statement about the founders' imagination and inspirational vision for making the facility a place that, by its physical presence, conveys a sense of celebration and honoring of Nature. The essence of a successful nature center building is that it looks like it fits into the natural landscape and is programmatically functional in educating and sensitizing its clientele to Nature. What you do with your building will speak so loudly to those who visit they will not hear what you have to say about celebrating and honoring nature in your programming components if the the two dimensions, building and program, are not in harmony with Nature.

One of the key difficulties in addressing the issues of Nature Center architecture arises from the fact that very few people have experienced a professional relationship with an architect. They do not have a good idea of the range of services an architect can provide a client, or of the limitations with which an architect works. The key to an architect-client relationship is communication. The client must be able to accurately communicate what it wants and needs in a facility. They must be able to communicate a vision. Often the "vision" in the Nature Center project is the composite vision of a committee. The architect must be a sensitive listener who can draw out and graphically harvest the clients' vision and design the communicated "needs and wants" into a functional facility that has an inherent elegance in its design integration with the nature of the site. This is no small task when the design process is facilitated as a "committee function," often with the majority or all of the committee members engaging in their first design project. Under these

circumstances a major responsibility for design criteria must fall on the professional staff's expertise. A dilemma that often occurs in the development of a new Nature Center project is that the director and staff are not hired until the design process is either well underway or completed. Under these circumstances the guidance of an experienced architect is critical to not only design the facility, but to guide the design process to assure the community optimizes its building opportunity.

Then, who is the ideal architect for "your" committee to work with? As with Nature and its principle of diversity, so it is with the architectural profession. Architects are a diverse lot. The key to a great Nature Center project is to find the architect, or more often the architectural firm, that best matches the style and personality of the Nature Center "Building Committee." Just as with the selection of any type of professional service, choosing an architect can be a confusing or serendipitous endeavor. There are some generalizations regarding architects and architectural firms that may help sort out the finding of the right one for your situation. A very high percentage of members of the architectural profession have a strong affinity for nature and a strong personal environmental interest and ethic. Thus, finding interested architects for a Nature Center project is usually not difficult. In the world of not-for-profit organizations the greatest temptation is to accept the generosity of architects who are willing to "donate" all or part of their services because they support the project, or because they have been asked to do so by someone they value who is associated with the project. As generous and valuable as such an offer may be, it can lead to difficulties in the long haul as the design process proceeds and client wants and needs may be in conflict with the architects' design concept. Such a generous offer must be carefully weighed by the building committee and Nature Center Board to be certain the client-architect relationship will flow smoothly and in a compatible manner throughout the design process to achieve the result all enthusiastically support.

Some architects are known for their innovative design work; others for their efficient, cost effective designs; others for their attention to detail and the supervision of contractors' work once the job begins. Small architectural practices may be very responsive to personalizing their service while a large firm may offer a wider range of more sophisticated services and design support services.

There are strategies that have proven to be effective in selecting an architect when there is no clear architect-building committee association that has grown from a long standing relationship or an initial interview that results in "a strong positive relationship" between architect and committee.

The first step in the search for the project's architect begins with the Nature Center building committee doing its homework. Visitations to other Nature Centers, review of other Nature Center Plans when site visits cannot be arranged, and phone conversations or correspondence with others who have experienced the design of a new Nature Center facility, are invaluable. Then the development of a Nature Center philosophy statement, general program goals and objectives, a general conceptual description of the types of activities the facility will support, and an initial target budget figure for the total project, or at least for the

first building phase, should be crafted. This work should be followed by the development of a set of Nature Center program specifications. The program specifications identify the activities (administration, variety of programs, exhibits, shop, special events, audio visual, live display, interactive computers, etc.) that are anticipated to take place in the facility and on site and the types of "spaces" required to support all activities. "Bubble" diagrams showing the relationship of these spaces to each other and the relative size of each space needed. This activity is often enhanced by hiring experienced Nature Center personnel as consultants to assure as many functional considerations as possible are included in the documents which will become the program design guide for the architect. If the Nature Center program specifications are initiated prior to the hiring of an architect they should go through an extensive review with the architect when he or she is hired.

This general statement of purpose, program, and project proposed budget may then be drafted into a "request for a proposal" letter that is sent to all architects in your region, or to a select group of architectural firms you have prescreened. In a large urbanized community the request may be for architectural firms to submit a written prospectus on their interest and their qualifications for participation in such a project. From the respondents you may next choose the three or four firms making the most appealing proposals to come to a meeting and to each make a separately scheduled one hour presentation on their unique qualifications, similar work they have completed, and how they might plan on conducting the design relationship between their firm and you, the client. From a series of presentations like these you can gain some insight to the "personality" and "style" of the firms' principals and, of course, an insight into their technical and professional experience and organizational services. It always helps in these interviews to have a few well thought out "stem questions" to ask each of the invited firms to respond to, as well as to engage in the free ranging discussion that is likely to emerge. Probe! Probe! Probe! until you really feel you have gained a clear picture of the architectural team or principal architect with whom you will be working if you select their firm for your "once in a lifetime" Nature Center project. Most architects have a pretty standard contract form but be sure you have a clear understanding of your contractual obligations as well as the obligations of the architects so deadlines can be successfully achieved and the project grows on schedule.

Another important design strategy is to formulate a panel of reviewers for the review of the design at each of the key development stages. The panel should be made up of a variety of "users" such as, teachers, other Nature Center Directors and staff members, local school system science supervisors, experts in passive energy design, interpretation and exhibits, maintenance, custodial services, and local builders. Most of these people will be willing to review and critique plans by simply writing their suggestions on blueprint copies of the facility. This approach will lead to in depth discussion of your plans and either affirm their soundness or provide a stimulus for improvement and refinement.

In summary, the design process is a dynamic one. Architecture has its roots of design in nature. An elegant Nature Center design will be the outcome when the professional skills of an architect are blended with the commitment of a dedicated community team that is willing to do its homework well and maintain an "open" design process to create a facility that models an ethical and sensitive presentation of nature, not by overpowering it, but by becoming one with it.

Choosing an Architect

by Bill Hammond

I did a research project, profiling architectural firms in a whole community from small to very large firms. I was looking for a brain dominance pattern and style of the individuals and the collective group. Each has a personality. I finally understood the reasons for a lot of problems. We found that there are essentially four kinds of brain dominance patterns architects will manifest and that we need to be aware of for the sake of better communication with them. I use the analogy wherein these patterns are reflected in the way a person responds to a flower.

For purposes of explanation, picture a circle that is split into four quadrants. Beginning with the upper right quadrant and working clockwise, label them 1 through 4. The upper right will be "1."

In quadrant "1" I put the kind of architect that experiences the flower: the aesthetic aspects, sensitivity, personal space, and lots of interpersonal interaction.

In quadrant "2" are the architects that want to take the flower apart to make a little park. They will make a long list, a lot of survey analysis of user types of this site, a lot of detailed study work.

The "3's" are the doers. They use data bases and intellectual information and they want to translate it into work. They will keep you on task. They will be insensitive to your wants and needs. They will tell you what you need. It's a hard design process but you will get a product and it will be functional. You may not like it as much as if a "1" designed it. But when a "1" designs a building, it will be beautiful and feel great, but it may not work. A "2" will usually get you a building that works, but it will be somewhat sterile more often than not.

Where the 3's plant flowers in great formal order the "4's" will plant flowers, but they will be wildflower fields. They enhance, they embellish what they do. They have lots of creative diversion ideas on how things work. You may end up with a center with all kinds of pieces that may not seem to fit that well but they know in their minds how it works. The trick is, do you?

There are architects in all four of these quadrants. Usually an architect is a middle class person, who is usually white, male, although that is changing rapidly. There are not many rich architects in the US despite what you see in big buildings, etc. As a profession architecture is probably the poorest outside of education.

They are visual thinkers more often than not. They must have analytic skills to get through the engineering components of their profession, but most just skim through it. Some are production architects who do a lot of building and make a lot of money. But they are not creative.

Architecture firms can be classified in the same way. There are #1 firms. These are the ones every young graduate wants to work for. They are the bonded slavers of the profession. They are so into design that they forget the business end, and end up paying their interns almost nothing but they come to work there because it's such an exciting place to work.

The #2 firms are pretty much cranking out architects. They have some creative ideas, but they process through things in a pretty linear way.

The #3 firms are those which are highly production oriented. They are usually well organized, team oriented and produce buildings that are very cost efficient. They have high profit ratios, get things done in an organized fashion, and they are very good at this kind of thing.

The #4 firms are hard to stereotype because they tend to bounce around a lot. Very creative projects, and they will also take on anything.

Small firms tend to fall into one of these patterns, being made up of people of the same type.

Fees are somewhat negotiable. Some will be willing to make a donation toward the end of the project. Ask during the selection process. If there is someone you know who is great in your community, ask for a proposal. If not, send out to the architects in your region and give a large range in price, for a proposal. Give dates, and announce that you would like to entertain proposals. Then you will see who is interested. Look at styles, talk to clients, find out who did what building. Pick out three or four firms that make sense to you. Then set up presentations. Block out time for this, scheduling a group every hour or so. Then probe these people extensively. Get them to talk and find out what kind of people they are. Narrow it down to two and interview them in depth. It takes time, but you will learn a lot. There will be very diverse presentations, which can point out a lot of things to you. There are a lot of ways to get there, and there is no "right" way.

In the interview process, know what you want and what you can sell to your committee. You will get what you deserve. Force yourself to plan, and to brainstorm about who you will serve and for how long.

How to Work With a Funding Agency

by Mike Templeton

My talk will be on funding and very informal. I am from the National Science Foundation which is an arm of the federal government responsible for basic scientific research other than the mission agencies like the Fish & Wildlife, etc.. NSF has a budget of about $2 billion a year. In the words of the late Everett Dirksen "a billion here, a billion there, pretty soon we're talking real money." About $200 million is spent each year on science education, all the way from post-graduate activity to pre-school, and one of the programs in the Science and Engineering Education Directorate is the Informal Science Education Program, where I am program director.

The program director is basically a person who has the extreme good fortune to be given an endowment, the interest on which he has to spend. The Informal Science Education Program has a roughly $150 million endowment. You probably know most of the foundations in the country that are worth $150 million or more, but what you may not realize is that there are "tax endowed" foundations. There are hundreds of government programs (Dept. of Education, NSF, Institute of Human Services, National Endowment for the Humanities, etc.) each is like an endowment in that program officers and a limited number of people make the decisions in how to spend those funds. So I don't really have $150 million, but I do have the Internal Revenue Service to collect taxes. Every year it gives our program $15 million through the federal budgeting process to spend on worthwhile projects. So the leverage we have is as if we were a $150 million endowment. We spend about $15 million a year on a variety of activities all outside the school.

The Informal Program that I represent supports out-of-school learning. That means all of the things that nature centers have been saying, all the of arguments about engaging funds, how to raise money, how to work with these things, how to make $1 do the work of $10! You are right in the middle of the environment that I deal with all the time in talking to prospective proposers of projects. I'm very familiar with this environment and I love it. That's where I'm from, what I do, and I will try to talk now more generally about funding, to relate to what you will talk about in your sessions later today.

To start out with this, we can't talk about fundraising without having any money. So, the first step is to raise money. What I would like to do is raise some money, so that we can give it away. (*A simulation activity is begun at this point with the passing of a large tin measuring cup, into which participants place donations.*) You'll notice I brought a tin cup. Some of you may know about tin cup fundraising. You go around and ask people to put money in it. It sounds like we have enough. Thank you very much. The point of the exercise: money doesn't grow on trees, it doesn't come from "noplace." It has to come from someplace. What I will try to do is to get you to think about this from the point of view of the funder, rather than the point of view of the applicant.

You have just given me your money (*shakes the cup which now contains $1.75 in small change*). This is your money, just as it is for tax dollars. My

job is to act on your behalf, and on behalf all funders, all program officers, all people who run foundations. The people who make decisions of this kind are agents of you. They're not the enemy. They are not the adversary. They are not evil. In one way or another they are your representatives. If you think of what you are concerned about in this simulation, you will know how to talk to us, you will know how to deal with what we have to do. Because now it's your money on the table, and the question is how are we going to spend it? What are we going to do with it?

Remember , it's you who are now the funders. And you are nervous about this because it was your money in the first place. How are we going to figure out who ought to get it? I'm trying to make you aware of some things, not trying to get you to resolve the issues.

For the purposes of this demonstration, let's agree on a goal. We can assume that all of you come from nature centers, and have strong interest in education in the natural sciences. There is probably enough money here to buy an inexpensive publication worth a dollar or two or three, that would be appropriate for a small child. So our goal is going to be to use this money by financing somebody's program of publishing, purchasing, distributing natural history information to needy worthwhile individuals. What we happen to know in this case is that it's probably only going to pay for one book for one kid. So that's our program. We need to define a goal that can be met with the sort of resources we have available, and it's clear enough that you all know what kind of action might fit within the program. Now we need some proposals. Then we need to figure out how to choose among them. So I would like within the next half hour to have, say, three people agree to write proposals. You can write them in your head or on paper, but you will only present them orally. What I would like is three volunteers, and in 10 or 15 minutes we will give this group the proposals on how to spend the money.

From the point of view of the funder, we have programs with purposes behind them and things that we want to see done. You at your end have needs. You have things that you want to do. You have a very strong desire to please me and you have a very strong desire to find out what you have to say to get "my" money (in reality, your money). It's a little tricky. Maybe if you are trying to get your own money back, you will want to play the game a little more honestly and more straightforwardly than if it's somebody else's money. If you want me to be a good steward, you probably want me to think very carefully about those decisions.

As a proposer, it probably means that you ought to give me a lot of good information to make that decision and not just a line of talk. Your interest as a taxpayer is that I make the wisest possible decision. So, what happens when you're starved for resources and you don't have enough money to do what you want to do? You don't have any money to do new things. You know there are people out there with money and programs. The problem is the programs don't fit what you need. Because they never do. So what do you do? Do you try to find out what I want? Do you try to get me to change my guidelines which aren't going to match your needs? How do you proceed in this real world, where for whatever reason, the program statements, the rules that the funder uses don't match what you or your local institution need? How do you proceed?

What sometimes happens is, that people will be so hungry that they will say "Tell me what I have to do to get a grant." I think the saddest words I ever hear are those. Because these are people who are well-meaning, well-intentioned, and who either are so hungry that they have to do this to stay alive, or they have forgotten why it is they are alive.

It is terribly important to insure that you have dollars chasing ideas, rather than to have ideas chasing after dollars. That's kind of a cryptic statement. But what it means is: know what you want to do. Figure out how to make the marriages and find the sources of funding. And if somebody says, "I'm interested in this other thing," file that away in your memory for the future, but don't say, "Oh, great, we can do that too." Life is too short and your reasons for working hard and doing the things you do are too important for you to chase dollars, whether it be in Washington, D.C., or in the state capital or in a private foundation office.

Now, there is a slight twist on that that makes it work a little better. That is, typically you've got more than one thing you want to do. Structure a list of priorities. If you talk to staff about what is priority #1, priority #2, and priority #3, they will argue and put different items in those particular slots. They are all things that you want to do, and you want to do them badly. You ought to know what you want to do before you go to a funding agency.

What we call "window shopping," where someone asks, "What are the rules?" and "What do you fund?"doesn't play very well. What plays much better is somebody saying, "I want badly to do something in the following area, and there are a number of different ways in which I can approach it, and I would like to know whether your funding agency or your program or foundation would be interested in the following things that we are trying very hard to do." Hold onto what you want to do, and then find the people that want to do what you want to do, instead of trying to persuade us that you want to do just what we want.

The worst proposal is the one that meets all of the criteria in the guidelines. That's just somebody that has read the guidelines and written them up, and it's no proposal at all. It's just the guidelines given back to you. Such a proposal doesn't tell you anything. Lots of proposals are like that. On the other hand, proposals that are unique and and specific to the proposer contain ideas that come through and cause people in funding agencies to get excited. They like to see something they don't know, to get a glimmer of something they have never seen before.

As a simple example, two proposals come in. One of them says "There is a rising crisis in science education in the United States. Test scores nationally have been dropping in the following areas, etc." That is a needs assessment. Doesn't everyone tell you to write needs assessments?

Contrast that with another proposal. "In the state of Michigan, in a recent survey of 17 high schools, regarding test scores on seniors' knowledge on environmental issues, it was shown they were not able to answer more than one out of four questions adequately. And in a study of field trip experiences of 7th graders, we have discovered that 4/5 of the students in the state never get to a wild area before they go on to high school."

It's a needs assessment. But it's specific, it's directed at what you know. It's new information, and it's something that makes the reader of the proposal say "Gosh, I didn't know that. It's really interesting". Then they also say in the back of their minds, "These are people who know what they want and know what they need." So you just went up about 5 points on the credibility scale.

Now, how do you know who to go to with this, and who not to go to? As we said earlier, it takes a lot of time and effort to write a proposal. How do you understand where the conversation is likely to be productive and where not? This is really tough. It's tough for reasons that have to do with how we as funders behave, not the way you as proposers behave.

What's the most common communication that you get in trying to understand the interest and approach of a funding agency? ... My guess would be nothing. It's the phone call that doesn't get answered. It's the inquiry that doesn't produce a reply, or if there is a reply, it's a copy of the annual report. My general sense is that we as funders don't communicate very well. And we tend to make it hard for you to talk to us. In many ways this happens at different levels in different fashions.

A lot of it happens because people have learned. They're sadder but wiser. If they keep their mouths shut, they don't get hurt in the funding business. Sometimes it's because of depressive work and overload-lots of reasons. In my case, I know there are phone messages on my desk that I did not return before coming to this meeting. I just didn't have time to answer them.

Communication is a big problem. The funding agency has the problem. You people know how to communicate, and you try pretty hard. We have a hard time returning those calls, we have a hard time telling you what you need to hear. This means that a big piece of the process of raising money is figuring out how to communicate. Just getting the conversation going is half the battle. Guidelines, policy statements, lists of past awards are thin excuses for getting someone to tell you what they think, what they are interested in, and what they do and don't do as a matter of policy. How do you get that communication established?

The communication that you have is going to be different depending on whether you are talking about local, regional, national, governmental agency or private, corporate. Each of those niches has a different style of communication. I can distinguish it as the difference between close up and personal versus distant and bureaucratic. I think distance, literally, is more important than anything. If you have a local foundation, you know the person to talk to. You have seen him or her in the community. You've had some opportunity and reason to talk to him or her. You can have some conversation. Guidelines and rules don't really matter in this situation. With local private foundations, a conversation, a letter, a request for funding is often what matters. as well as who is on your board, who is on their board. In this case, an elaborate proposal rarely matters. A deep investigation of their policies of giving rarely matters. Most local foundations make exceptions all the time.

You probably know how to approach a local foundation. You do it the

same way you do everything else, eyeball to eyeball. I guess you probably have learned to avoid overkill. I've written several long proposals to local foundations, for I wasn't smart enough to realize that what I should have done was a three-page letter. And I could have gotten the money. We got the money, but it took a long time, and it didn't have to.

Now as you get farther away from the funder, the communication gets tougher, and it becomes bureaucratic. You have policy statements, and you have form letter answers, and you don't know what they're doing. So you have to manage the communication process more carefully. The worst case of all is the federal government, because we're as far away from you as we can get, we're as bureaucratic as we can be, because you, as taxpayers, tell us to be bureaucratic. Someone used the word accountability a few minutes ago when we first collected the money in the tin cup. Well, we are accountable. The way that we are accountable is to be good bureaucrats. So how do you cope with the other end of the extreme, with the federal agency?

At one level, you have to use all of the information that is available. (Indicates packets he has brought) Here it is. This kit of information is about five times as good as what you will typically get from a federal agency. Because, for example, in our division we have a four page sheet that is called 'review procedures.' This tells you in advance how we review your proposal. Most agencies don't do that. Guidelines will tell you the theory of the thing, a little bit of the rhetoric. Guidelines are written by committees. They are edited by committees. They have to be approved by committees. How much information do you think is in a set of guidelines? Not very much. Because all of the rough edges have been shaved off in the review process. It's only a technical document. It doesn't tell you what we will or won't fund, it just tells you what we all agreed on.

A lot of programs in the federal government will publish things in the federal register. Now, here's the catch. There is a notice in the federal register for an environmental education program that will support $3 million worth of projects, and the due date for proposals is 60 days after the notice in the federal register, and the guidelines have not yet been printed. Let's draw some conclusions from this particular scenario: the whole thing is compressed in time. It is only revealed in the federal register. There is no published solicitation or set of guidelines, and there is a reasonable amount of money involved.

First of all, unless you are very, very good, your chances of competing in that environment are small. You're likely to be a goldfish in with the sharks. It means that there are people who for three months have been working on the proposals, because they saw the draft guidelines before they were published in the federal register, and they have been polishing this thing for quite some time. And if you're not part of that game, you are going to have to be very lucky or very, very sharp to compete successfully in 60 days. There are not many very good 60 day wonders.

Now, it doesn't always work that way; it's not always because the fix is in. Sometimes it happens because the funding agency was overtaken by events. The famous State Department phrase "O.B.E." As in Central

Europe right now, everyone is "overtaken by events." Sometimes you just didn't get the guidelines out in time, and you have to spend the money because September 30th is the end of the fiscal year, so the deadline for the proposals is the 1st of August. In that case, it's still a fair fight. But nobody has any time to submit a very good proposal. So be very very careful about windfall opportunities that have very short fuses. At the federal level, those are usually chimerical. At a state or local level where you know the people involved, you might be able to make something out of it. But at the federal level, those things are usually disappointing.

When you have the chance to communicate with a federal program official, at any level, meaning on the phone, in person, by mail, that is a golden opportunity. It won't seem that way. Because the information you get won't seem terribly specific or terribly worthwhile. It's not like you're getting insider tips; there's no secret to any of this. But what you will get will be a sense of what's up and what's down, what people are interested in, a little indication of what fatal behavior might result in a 'no.' Listen to it, think about it, read between the lines, use it. Because it's the best you're going to get in most cases. In many agencies, you have to submit a proposal unassisted, with no contact and no commentary from the program. These are at-arms-length submissions. The rules are there. Follow the rules. This is very hard to do as a first-timer, if you haven't had an award of that kind.

So, if you are going to submit a proposal to a funding agency that is an at-arms-length transaction, with nobody to look at preliminary proposals, nobody to give you advice, nobody to suggest changes in a draft, etc., it is a good idea to find somebody who has won one to advise you. If you can't get contact from the program, find an awardee who will help you. That's the only way you are going to learn the game. Doing it at arms-length with no help is too hard. Sometimes you can get some help. Somebody in the program will talk to you about it in a rushed five-minute phone call. I do that a lot. I'm talking to somebody on the phone, while I'm finishing typing a letter on the computer terminal, and I'm trying to pay a lot of attention to what somebody's doing, but I've got a

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couple of other things to do and my mind comes in and tunes out. But still, you are at least talking to somebody in the program, so pay attention to what they are saying.

Sometimes, as in our program, you can actually send in a preliminary proposal. We require it. You don't have a choice. In other cases it's voluntary. That means you send us a short draft and then we write back a letter that says this is a teriffic idea, why don't you send us a proposal? Or we write back a letter that says, "Ahem, well, er, uh, not for us." That's the best communication you're ever going to get. Because somebody has taken the time to think about your proposal. They actually spent five or ten minutes and thought about it, and they said, "What do I think about it?" Then they turned that into action and said, "OK, here's what I think." That gives you the ability to use your time wisely, to know whether or not to submit to that agency.

What do people sometimes do when they receive a negative response? They say "I'm wounded to the quick!" and "They didn't like my idea!" or, "He's stupid! He doesn't understand! Of course it's a good idea!"and then write a three page letter explaining why we came to the wrong conclusion. They would be better off if they actually wrote the proposal instead of writing the letter. We didn't say you couldn't submit a proposal. We just said we don't think it's competitive. So, don't argue with the people in a program, pick their brains, find out what funding agencies know. Ask them leading questions. Say, "I was very interested in the fact that you disapproved of our use of retired forest rangers as educators-can you tell me why that is?"

Listen, listen, listen, listen. The communication channel is so poor at the federal level, generally, that you have to become powerful listeners. I wish I could say we could do it all for you, but we can't. And it's this problem of being distant and removed instead of close up. And that's just the way it is with federal money.

How are proposals read and evaluated after they are submitted?
Every program is different in the way this is handled. In the Informal Science Education Program we have a reading circle. That means that every preliminary proposal gets routed to each of the program officers, a minimum of three people usually. Sometimes we pick somebody who's outside of the program. Everybody writes at least two or three sentences about each prelim. and grades it with a numerical score high to low. Then we make a decision. Do we encourage him to submit or do we discourage? Or sometimes we will say, "Send us more information. We can't tell yet." If everybody agrees, it's automatic to encourage or discourage. In any case, one program officer is assigned to handle that communication. So there's somebody whose job it is to say yes or no. The Informal Science Education Program uses this method rigorously. We have three people that read. The Instructional Materials Program uses it rigorously, and they have sometimes three or four. The Teacher Enhancement Program does not use it. At the option of a program officer, they can accept a prelim. or not. Sometimes they will say no, but talk to you on the phone. Sometimes they will simply send you the guidelines. Rarely will the Teacher Enhancement Program look at a draft proposal.

In the Informal Program, if we get a draft proposal a month and a half

before the program deadline, we will actually look at a draft and call you up. If we get it two weeks before the deadline, we won't. Each agency has a different behavior, and each program has a different behavior. What I'm saying is find out for whatever agency you are going to what they are willing to do, how to use the communication channel, because it's an imperfect noisy channel that you have to use however you can.

You should always start out on the telephone. The telephone is the world's most inexpensive means of communication. And whoever it is, call the office and say, "I'd like to talk to someone about..." They may say, "we don't know anything about that." "Well, can you tell me who does?" No one in the federal government will ever hang up on a caller. You are taxpayers. What we will do is send you through an endless search of the telephone system. But we will never hang up!! And sooner or later, if you are lucky you will find somebody who is actually the right person. It may take four or five referrals, but usually it ends up someplace.

Now, when you talk to someone who is in the right program, or apparently the right program, ask for guidelines or other information they can send you. Then somebody will take care of you. Or you can send in a letter or a postcard requesting guidelines on the following: etc. etc.

This raises another interesting point. What about mailing lists? There is no such thing as a permanent mailing list. There are all sorts of mailing lists, but there is no list manager at NSF. I suspect it's also true in other federal agencies. That means that these lists build until they collapse under their own weight, and then they build them up again. And there is no indexing that says to send some materials but not others. So you can get on the mailing list for a regular publication, but that does not mean you will be sent a new program announcement. We send out everything to people who are current because it's current awards. Don't depend on the mailing list. Asking to be placed on an agency's mailing list is a very careless request. Do it as an experiment, but don't expect it to work. What works is to send for the most current guidelines.

There are a lot of different procedures used to determine both the quality of applications and to make decisions. The only point I want to make here is to distinguish between two things. The first is gathering information, and the second is making the decision. Reviewers, panel meetings, all of those things usually are information resources for a decision. At NSF, they are usually not the decision itself. Reviewers don't decide whether you get the money. Written reviews and their scores don't decide whether you get the money. A program officer backed up by a chain of signatures is responsible for the decision. So, a group of us can provide input and information, rate proposals, and do that qualitatively or quantitatively. We can write devastating essays, we can praise projects, we can use scores from 1 to 10, there are lots of ways to do that. That's all information, it's not a decision. Finally, someone somewhere had to say yes or no. Award or decline to award.

The point of this is just to get you thinking in the shoes of the people who have to make these decisions, and to understand a little bit about the process. I must say I'm extremely impressed with the proposals we got, seriously. They all reflect a fairly sophisticated understanding of the

process, and varying solutions to that process. I have not had a chance to talk about NSF in detail, we will do that this evening. I have packages of information, including telephone directories, the most golden instrument about a government agency. You should all know about National Science and Technology Week. It is a national promotion held every spring.

Here is an important point on the matter of rejections. When you talk to someone, and they say that somebody rejected their proposal, or disapproved their proposal, those are really bad mindsets. No federal agency ever disapproves of what you are doing. Nobody rejects what you are doing. All they do is to say, "I can't give you the money." We decline to fund. It's not a judgment about the quality of the project, or the value of what you are doing. It is simply a statement that this program at this moment in time, for whatever internal reasons, is not going to be funded. Don't take it personally. Understand why, so you know what to do the next time, but it is never a statement about the project itself. It's always a statement about our ability and willingness to fund. Nothing more.

The effect of congressional influence depends on the agency and the program. In the case of NSF, congressional influence is extremely small and has little effect on what we do. Congressional influence has a big effect on how much money we have, and they can tell us to fund a program, but they don't tell us to fund projects. We have a very well established system to manage congressional inquiries. Other agencies have more politically tuned programs.

The important thing is to know which context you're in. Because if you sic the congressmen on NSF you're actually hurting your cause. It just annoys me, it doesn't do any good, just irritates. On the other hand, if you don't sic congressmen on some agencies that are politically motivated (politics is not a dirty word), then you will just never be in the running. So it really depends on the situation. Typically with things that are science based, the rule is "quality is what matters, and politics and geography and local concerns do not." But even there, we are senstitive to special constituencies. Programs that deal with minorities and handicapped individuals will receive extra attention because we think that those constituencies are important for a variety of reasons. But anytime you want to bring a congressman into the picture after you have submitted a proposal, I would think very carefully about it, and only do it after you have gotten good advice from someone. Congressional offices are very good places to do research. The cheapest grant assistant you will ever hire is a local contact in a congressman's office. You simply call them and tell them you would like to know all the federal programs that could support educational programs based around the revitalization of streams. The person will poll federal agencies, signed by the congressman. Those letters are always answered.

The Tiorati Workshop for Environmental Learning: An Alliance with Teachers

by Donald S. Cook

Children arrive at an understanding of the natural world through their own personal engagement. Concrete and visible processes—a form repeated; a cycle completed in time within a child's grasp; a function performed—reveal relationships to them. A child's ideas about nature are not simply learned, but rather constructed by the child in the course of many interactions with the natural world. They must be given the time to observe and describe, to discover and announce patterns and to reach for generality. Children *learn* to have (or not have) ideas about such familiar phenomena as the wind and clouds, flowering plants and rotting logs. The psychologist Eleanor Duckworth (1987) teaches that "all kinds of things are hidden from us—even though they surround us—unless we know how to reach out for them." An education which presents children with materials in an atmosphere accepting of their own "wonderful ideas" develops the children's confidence in their ability to discover things about daily phenomena of nature.

Young children begin school more than adequately curious about the natural world. Yet, by all accounts we are not teaching our children that they can master knowledge of the natural world. The National Assessment of Educational Progress reported in its 1986 survey of pre-college educational attainments that "young people graduating from high school are found to be increasingly deficient in understanding basic scientific facts and processes" (Mullis and Jenkins, 1988). Specifically, elementary school teachers devote absolute minimum classroom time to science study. If we expect students to graduate from high school with sufficient knowledge of natural processes to assume responsibilities as voters, we need to do all we can to improve the study of science. Viable connections between nature centers and schools work to this end.

What we can do?

Environmental interpretation programs typically focus on a site. Programming consists of examining and identifying organisms, explaining the relationships among organisms, considering environmental balance and deterioration (thus introducing human causation through political and economic systems), and raising questions of personal responsibility.

Nature centers present their sites as museums present collections. Interpretation sometimes features the rare and beautiful, sometimes the larger environmental systems which we would have visitors understand. Such site orientation has aesthetic and intellectual appeal. Contact with nature excites wonder. Into the story of a place an interpreter may weave a large message. We can take a bounded story into our grasp.

What are the implications of establishing programming for schools as nature centers? A recent body of educational literature has paid considerable attention to the evolution of children's concepts, particularly the role of action and thought in the development of ideas. Learners are described as building theories of structure and causation. Ample

evidence demonstrates that learners, children and adults alike, persist in erroneous or naive concepts in the face of traditional instruction. The evidence persuades us at the Tiorati Workshop to orient ourselves to the situation of the learning child. The central aim of instruction should not be, as David Hawkins (1986) so eloquently put it, to cover subject matter, as to uncover it.

My purpose in this presentation is to present an alternative model for educational programming in nature centers. I shall describe the relation we at the Tiorati Workshop maintain with classrooms. The key aspect is the leadership role of teachers in the nature center experience.

The Site

The Tiorati Workshop for Environmental Learning, in Bear Mountain/ Harriman State Park in the Hudson Highlands, about forty miles north of the George Washington Bridge, is a collaborative venture of two institutions; the Palisades Interstate Park Commission, which administers the Park, and Bank Street College, a graduate college of education in New York City.

The facility consists of a stone and wood structure, built by the Civilian Conservation Corps in the 1930's. For many years the edifice was used as a Community House for summer camps run by public service organizations. In the mid-1970's it was winterized and converted to its present use.

In the center of the structure a weathered cedar invites children to gather. The space is divided, in a pattern that radiates outward from the cedar, into eight units, including six work spaces. Storage counters make the divisions. Open-slat partitions above the countertops define the work areas while preserving the cathedral-like spaciousness of the building.

The division of eight repeats the pattern of two octagon windows high on the east and west walls. The eight-sided pattern is reiterated in the shape of vivaria, lamp shades and the webbing of the chairs. The repetition in the design suggests the repeating natural patterns children may find in the forest. The outward reaching branches of the old cedar and the radiating spaces suggests the unity of parts and whole.

The Workshop is equipped with collection materials and microscopes for pond and forest study. A complete kitchen occupies one of the work areas. The other work spaces store materials for the making of natural dyes, batik, woodworking, painting and collage, weaving, electrical circuits, and so forth.

The Workshop impresses visitors as a beautiful and welcoming space. The Tiorati Workshop is surrounded by an oak-birch-pine forest. It is a short walk to Lake Tiorati, which has the dubious distinction of having been twice dammed. In the 18th century the stream was controlled to provide a continuous flow to drive the bellows of an iron smelting furnace. It was again stopped to provide recreational use early in this century.

The silting of a small recess in Lake Tiorati has formed a productive micro-environment. Adult and larval bull frogs, various small fish, turtles, and other pond organisms reside. In the Spring peepers emerge from the forest to lay eggs in the water. We draw water samples with copepods, daphnia, tubifex and nymphs of damselfly and dragon fly.

We have access to more distant interpretive resources. A rock face, created by glacial action, sheltered pre-Columbian hunters and gatherers. The Park's Trailside Museum houses a collection of fragments, utensils and projectile points from this and other sites in the Hudson Highlands.

Cavities and tailings remain from eighteenth and nineteenth century iron mining. There are certain spots near the relict mines where the needle of a compass will spin over a remaining vein. The silting of mining pits and the overgrowth of mining roads illustrates the natural reconquest of the derelict early industrial environment.

The Schools

About eighty teachers participate in the educational program of the Tiorati Workshop each year. Fifteen public schools in four suburban districts and four New York City districts. We aim at an equal balance of programming days for New York City and suburban schools.

The urban/suburban dichotomy conceals the diversity of the metropolitan area, for the "urban" patterns of high proportion of minority students and high incidence of language other than English spoken at home are represented in some of the suburban schools we serve.

The Program

The Tiorati Workshop program has two sources of inspiration; the site of the schools, the Workshop and the classrooms. It reflects the diverse missions of the collaborating institutions; the Park has a mandate to

provide interpretive programming; Bank Street College has a mandate to improve the quality of teaching, the quality of life in classrooms.

Classes of elementary school children come to the Workshop for day-long programs; buses bring them to the Workshop at the beginning of the school day, and return them in time for the end of the day. Our contract with the schools stipulates that each class will visit twice, in two different seasons, and that Workshop staff will provide a third experience in the school.

Each experience is preceded by at least two planning sessions with teachers. The planning sessions are usually held in the school. Typically the first session consists of a conversation about the children, the curriculum, the work going on in all subjects in the classroom, the teacher's hopes for the next few weeks and so forth. We aim to agree on a theme for the day with the children at Tiorati, and to begin a list of possible activities.

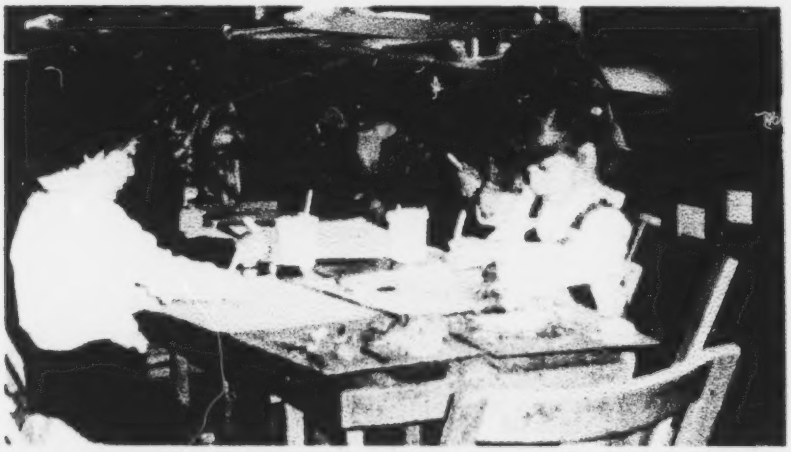
In the second session we decide upon activities and plan for the details of the day: who is going to lead each of several activities, the time schedule, materials that will be provided by the workshop, materials that will be brought from the school.

Teachers reveal starting points and themes to us, as we listen to them. In a first grade classroom I saw a graph of children's birthdays on the wall. The teacher told me she was trying to teach about graphs, but really could not think of many things to graph. That was a starting point. The class spent their day at Tiorati, absorbed in the natural world, counting and measuring, and graphing.

On another occasion, with children about the same age, five and six year olds, two collaborating teachers wanted to establish collections in their classrooms to give children the chance to work with materials of the lake, forest, meadow and stream. They used the verbs *sort, classify, order* and *structure* to describe the work they had in mind for the children. Since the children were so young, the teachers did not think it appropriate to instruct them in our adult taxonomies. The important intellectual task for the children was to look for patterns and similarities of structure, to discover ways to group materials the children had themselves collected, and to invent names for their groupings. In these two classes, daily meetings are the time when children present their findings to the whole group.

The collectors on the October visit to Tiorati were organized into groups focusing respectively on seeds and leaves, small plants and animals in the forest litter, soil and clay, and rocks. All the groups were engaged in the same kind of work: making a collection, talking about their collection, preparing the collection to return to the school and, at the end of the day, briefly sharing their discoveries with the whole group.

On subsequent visits to these classrooms I found three girls comparing two earthworms they had collected with mealworms they had been keeping. They had initiated the comparison on their own. The teachers had set up math activities and art work having to do with the collections. The children's work was called by various names, depending on the



"subject" content. Whatever the subject, the children were returning repeatedly to the natural materials, examining small details and making decisions based on similarities and differences they perceived.

The philosopher Jacob Bronowski (1956) taught that the "scientist looks for order in the appearances of nature by exploring such likenesses." John Dewey (1902) wrote of "continuous reconstruction, moving from the child's present experience out into that represented by the organized bodies" of knowledge we call subject matter. It is very important to us to establish connections to the curriculum.

In April, the same two first grade teachers were about to begin a chick hatching project. They decided that the theme for the day at Tiorati should be "Spring; beginnings of life cycles." We drew up a plan to have children look for (this time "collections" were out of order) evidence of awakenings from the pond, (eggs, tadpoles, small fish and small plants); the stream below the dam (frogs, salamanders and eggs in quiet waters; caddisfly larvae under rocks of moving water; plant buds, shoots and flowers along banks); the meadow (sprouts, flowers, spiders, insects, birds nests); the forest (buds on twigs, small wind pollinated flowers, emerging leaves, crawling and digging creatures). The teachers understood that to be meaningful, categories about nature needed to be grounded in the children's experience. The beginnings of life cycles theme set the stage for continuity between the classroom program and the experience at Tiorati.

The substantive knowledge of science and natural history often daunts elementary school teachers. Sometimes we help teachers focus on how we come to know things.

One third grade class, to cite one instance, had been studying native North American culture. Specifically, the class had looked at Indian technologies—making tools and dyes. At Tiorati the children collected clay from the banks of a mountain stream. The teacher and naturalist had planned that the children would process the clay and use it to make rudimentary replicas of Indian implements.

The teacher and naturalist intended to develop a scientific investigation of

the physical properties of clay with the children. Mindful of the importance of finding out how children are thinking about the problem before them, the teacher asked the children, "What do you want to do with the clay?" The children asked Mrs. Smith: "Can we grow seeds in clay? What will happen if we put eggs and milk in clay?" Mrs. Smith replied that she didn't know. This startled the children: "But you're the teacher. You're supposed to know!" Mrs. Smith insisted, "Yes, but you have to figure this out."

The teacher and naturalist decided to let the children try these experiments, as well as others they suggested, mixing food coloring with clay, and salt with clay (to see if the salt would form crystals). They got excited and used each others' ideas. After setting up one project, they went on to the next. The kids were flying around, industrious, wondering.

The children continued this work in their classroom, and ultimately presented these investigations as their Science Fair project. They knew all the answers to the judges' what, why and how questions.

The Role of Teacher Education

The principle operating through these four anecdotes is that the day at Tiorati belongs to the class, and that the teacher is the leader. We encourage teaching assistants, parents, and other adults associated with the classroom to participate. Each will have a role in the day. The teacher and one or two members of our faculty always lead groups of children in activities. Parents and other classroom assistants may also. A member of the Tiorati faculty or the teacher may introduce the program to the kids and lead the sharing at the end of the program of activities. We make conscious decisions about this in our planning sessions.

Counting on the adults who come with classes for leadership has obvious implications for programming. We have to balance the kind of skillful natural history interpretation that goes on at almost all nature centers with developing the connections with the classroom program and empowering teachers. Teachers who continue in the Tiorati Workshop program learn new ideas and take responsibility for trying out new materials with the classes. Trying something new is always risky. We organize these days to support teachers as they begin to involve themselves with children in the natural environment.

How do teachers entering the program learn to feel comfortable with study of the natural environment? We have either to train or educate the teachers. The difference matters vastly. We do not see what we provide teachers as training in the usual sense of that word. Training would consist of putting some materials in teachers' hands and showing them how to use them. Training is focused and specific. Rather, we provide teachers a broader orientation to the natural world. We teach them to question, to prove, to become—themselves—independent learners so that they can recognize the learning that accompanies children's excitement in the natural world and enchantment with objects of the natural world. In all our programming, we cultivate teachers as leaders of children. We think of our program as a teacher education program, not a training program.

Entering teachers take a Bank Street College graduate teacher education course. The enrollment mixes graduate students entering the profession with classroom teachers at various stages in their careers, achieving a blend of youthful enthusiasm with professional wisdom. The course meets for six days—in the Fall and Spring terms it is six Saturdays; in the July term it is Fridays and Saturdays.

We organize the course around broad and integrative natural science themes: form, repeating patterns of form and function, parts of the whole, and developmental change. Children construct ideas about the most important environmental relationships (habitat, community, adaptation, life cycle, etc.) if allowed to spend time observing concrete examples and describing patterns they notice. The descriptive language of forms, patterns and changes, and the relational language of form and function, part and whole, sequence, and cause and effect provides teachers with the resources of analogy, "hidden likenesses" (Bronowski, 1956), for children to draw upon as they construct their own ideas about natural processes they are witnessing.

Jacob Bronowski wrote in Science and Human Values, "Science finds order and meaning in our experience." By putting teachers in touch with their own experience of learning we begin to think with them about how children find their own associations and construct their own meaning about the natural world. Eudora Welty, in a recent autobiographical piece, wrote:

> "Learning stamps you with its moments. Childhood's learning is made up of moments. It isn't steady. It's a pulse.
>
> "In a children's art class, we sat in a ring on kindergarten chairs and drew three daffodils that had just been picked out of the yard; and while I was drawing, my sharpened yellow pencil and the cup of the yellow daffodil gave off whiffs just alike. That the pencil doing the drawing should give off the same smell as the flower it drew seemed part of the art lesson—as shouldn't it be? Children, like animals, use all their senses to discover the world. Then artists come along and discover it the same way, all over again. Here and there, it's the same world. Or now and then we'll hear from an artist who's never lost it. "

Goals and Guidelines

In hosting the Confab on the American Nature Center, it was RTPI's intent to convene successful leaders and promote dialogue on three significant issues: education, funding, and working with architects. These management areas are widely recognized as problematic and require skillful handling. How well a nature center does in managing these areas often determines its long-term success .

Working in small groups and using the thoughts of our keynote speakers, participants were asked the following questions:

> What are the critical attributes of a successful working relationship with an architect and of good designs for nature centers?
>
> What are the critical attributes of successful marketing and funding development programs?
>
> What should the goals be for gaining the cooperation and participation of teachers, parents, and other care givers of children?

Each of the issues was taken separately. Participants broke into smaller groups to generate goals and guidelines which were prioritized, pooled, and combined where possible to form the list found in this section. Evaluation criteria were also developed which suggest some concrete indicators a nature center can look for in its own operation to assess its degree of compliance with the guidelines.

They provide the reader with an opportunity to gain the experience enjoyed by the confab participants. The guidelines are based less in theory and are more the products of the pain and sweat of some very successful people and their programs . The validity of the guidelines rests both on that experience and the process through which they were generated and collected.

The goals, guidelines, and evaluation criteria are not presented in any order of priority. The numbers are provided only to clarify future discussion of them among confab participants and others in the field.

ARCHITECTURE GOALS & GUIDELINES

Architecture Goal I

To manage the vision. This goal blends creativity and management, balancing creativity and enthusiasm with the practical to achieve conclusive decision making.

Architecture Guidelines:

1. Define and understand the philosophy of the entire project, and how the architectural portion is going to impact it.
2. Sustain individual and organizational enthusiasm throughout the entire architectural project.
3. Include due proportional concern that the project fits not only the individual agency or center, but fits the associated land, town, community and area/region.
4. Adhere to a holistic mission that retains sight of environmental ethics and other established long-term goals.
5. Ensure unity of purpose and a willingness to support the project among the staff and board.

Architecture Evaluation Criteria :

1. What evidence is there that the process and the project continue to reflect the same philosophy and image as the rest of the center?
2. Have people who have been involved from the beginning, including board and staff, continued to participate in and support the process and the project?
3. After "fair" analysis, do people and/or other associated agencies/organizations from the area/region accept and perhaps complement or even support the project?

Architecture Goal II

To develop a functioning, dynamic project team to work with the architect to design an appropriate facility from the initial concept through construction.

Architecture Guidelines:

1. Set up a six to eight member committee (Director, education staff, and representatives of board committees) to work directly with the architect and to serve as liaison with board/staff.
2. Choose a chairperson who is a respected leader and will keep to schedules.
3. Establish ground rules for decisions at the beginning.

Architecture Evaluation Criteria :

1. Is there evidence of board/staff satisfaction with the process and that they feel adequately informed?
2. Did the design receive at least a 90% approval rating by the board and staff?

Architecture Goal III

To design for appropriate environmental technology.

Architecture Guidelines:

1. Make certain that the function of the facility determines the design (form follows function).
2. Be sure that the building or site message (its impression to the visitor) is in harmony with nature.
3. Make certain the design uses energy conscious utilities.
4. Plan for the lowest adequate maintenance.
5. Think about security.

Architecture Evaluation Criteria :

1. How will a first time visitor view the entrance to the site?
2. Can a first time visitor find the entrance?
3. Does the facility blend with the landscape or is it landscaped with nature?
4. Can the visitor walk easily through the facility?
5. Do room capacities seem adequate for year-round uses?
6. Are rooms designed as multi-functional?
7. Are there obvious maintenance headaches?
8. Is security tight?
9. What appropriate environmental technologies have been used in the design?

Architecture Goal IV

To establish a procedure to manage the process of selecting and managing the architect.

Architecture Guidelines:

1. Establish a table of organization.
2. Conduct a feasibility study.
3. Establish a master plan including time lines.
4. Create a proposed budget and plan for raising the needed funds.
5. Establish a clear decision making process.
6. Request proposals.
7. Determine who on your team is responsible for what parts of the process: developing requests for proposals and selecting the architect.
8. Learn how to read plans, blueprints and construction documents.

Architecture Evaluation Criteria :

1. Are you comfortable and working well with the architect?
2. Are you making good and timely decisions without a lot of anxiety?
3. Can you understand the materials or do you rely upon the architect for interpretation of plans, documents, blueprints, etc.?

Architecture Goal V

To have an ongoing design process.

Architecture Guidelines:

1. Establish a schedule of meetings and progress reports.
2. Determine the level of architectural support materials you will need to help the team visualize the design at each stage (i.e., sketches, renderings, models).
3. Establish a clear, written procedure for making change orders.
4. Remain open to change.
5. Appoint an external review committee.

Architecture Evaluation Criteria :

1. Does a time line exist that shows meetings and progress reports?
2. Is the procedure to change work orders written, and is someone authorized to make decisions on the spot?
3. Has a committee been appointed to review plans and time lines as the need for change arises? Who are the members of the external review committee?

Architecture Goal VI

To select an appropriate architect.

Architecture Guidelines:

1. Consider the following criteria in making your selection:

   Record of work relationships on past jobs

   Skills and functions of the firm

   Background on meeting construction deadlines, designs, credit rating, client satisfaction, and evidence of previous lawsuits, if any

   Willingness and ability to work with outside consultants

   Familiarity with local planning and zoning laws

   An advantage or reason for using a local firm

   Willingness and ability of the architect to supervise the project during construction

   Willingness and ability of the architect to work on schedule for deadlines

   Flexibility in payment schedule

   Ability to deliver appropriate environmental message through the design

2. Interview prospective architects and evaluate them based on the above criteria.

3. Determine a weighting for the criteria you choose to use.

4. Establish a common voting practice for evaluating each architect under consideration.

Architecture Evaluation Criteria :

1. Was the selection of an architect based on pre-determined criteria that were used in the interview process?

2. Were criteria numerically weighted?

3. Was a common voting process used for each architect and in the weighting of each of the criteria?

Architecture Goal VII

To develop a conceptual plan.

Architecture Guidelines:

1. Establish a long range plan.
2. Clarify needs and purposes of the building.
3. Define the purpose of the facility.
4. Assess the user market.
5. Involve staff and volunteers in the planning process.
6. Be politically sensitive to community attitudes.
7. Anchor the concept to the mission statement and philosophy.
8. Define how visitors and staff will relate to the facility.
9. Make a general decision about the budget range.
10. Establish a pre-campaign building fund.
11. Consider a design that anticipates future needs.
12. Include an operating endowment for equipment, staffing and operations in the fiscal conceptual plan.

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Architecture Evaluation Criteria :

1. Has there been an annual review of the plan to see if the items in the plan have been completed or initiated?

2. Do the programs and working conditions build on and adhere to the mission statement?

3. What groups are using the facility?

4. Is there a record of their number, level, and interests?

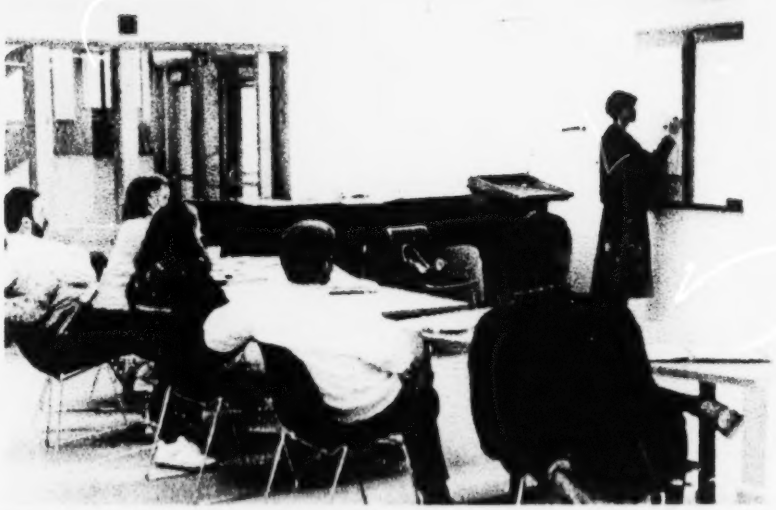
5. Is there evidence of meetings among the staff and volunteers to determine their perception of how the plan is or is not working?

6. Have there been surveys of the community served to see how they feel about the first year of operations?

7 Have the staff and volunteers been assessed for their opinion as to whether the concept has succeeded in promoting and carrying out the mission statement and philosophy?

8. Have visitors been surveyed to determine how they feel about the exhibits and program functions of the facility?

9. Has the budget been reviewed to see if it has been on target with anticipated costs?



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10. Is the budget still in the black at the end of year one and two?

11. Are ongoing fundraising efforts meeting the needs for the budget in tandem with pre-campaign dollars raised?

12. Do visitors and staff feel the building is functional? Have they been queried at regular intervals-5, 10, 15 years?

13. Has there been an annual review to determine additional needs, and to see if the fiscal conceptual plan provided the necessary dollars for working with budgets, staff, and equipment? If not, where do adjustments need to be made?

Architecture Goal VIII

To periodically evaluate the facility following completion of construction to determine whether it continues to fit your program needs and philosophy.

Architecture Guidelines:

1. Establish an evaluation team that includes: the architect, a board representative, a staff representative, the executive director, and a representative of the program served.

2. Bring an architect into your organizational family through an advisory board or VIP status (presuming there is good rapport).

3. Be prepared to rethink areas where practice and creative theory differ.

Architecture Evaluation Criteria :

1. Is there evidence of minor or major changes to the facility to fit the program and philosophy?

2. Has an evaluation committee been formed and is there a record of its having met?

3. Is there a plan with a schedule?

FUNDING GOALS & GUIDELINES

Funding Goal I

To develop a comprehensive public relations/media strategy customized to the people and location.

Funding Guidelines:

1. Develop a marketing strategy and time line of public relations as a first step in fundraising. Assess the needs for funding, study the market and determine categories (type of need vs. type of donor).

2. Understand the types of media, how they work, and how to use them to your advantage. Establish a continuing relationship with local radio and TV stations and newspaper reporters.

3. Develop a mission statement for local support groups, and become part of the local speakers bureau. It is important that the nature center join the local chamber of commerce and become a known community resource. Establishment of relationships with local and state government is important.

4. Develop professional publications for your organization that present your case: Who you are, what you do, and what you want. Present your case in a concise and professional manner.

5. Cultivate a well-connected and involved board of directors, and keep membership informed through newsletters, annual letters, and activities schedules.

6. Allocate sufficient personnel with possible pro bono assistance, such as a public relations assistant.

Evaluation Criteria:

1. Is there evidence of an increase of visitor attendance, donations, and requests for programs by local organizations?

2. Is there public and private acknowledgement of the nature center as an important community resource?

3. Have community organizations provided a source of funding as a direct result of informational programs given to them about the nature center?

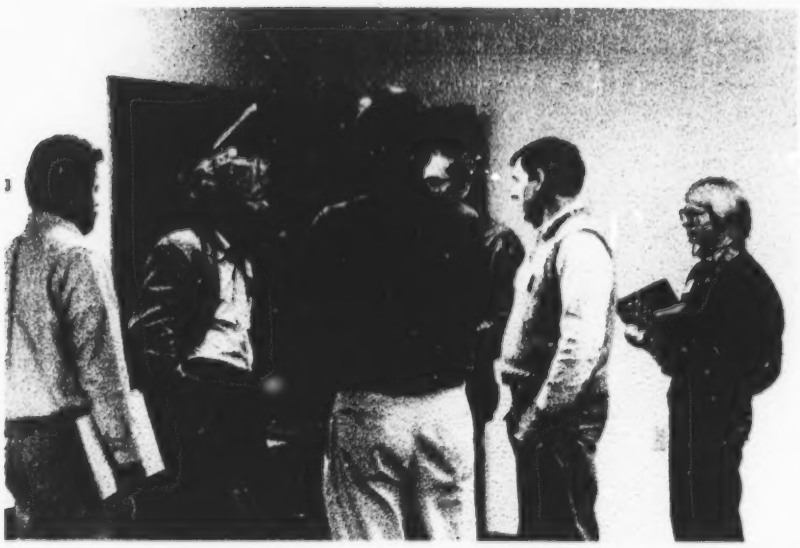
4. Have there been requests from the media for information?

Funding Goal II

To develop a financial plan and strategies which reflect the center's mission statement and long range plan.

Funding Guidelines:

1. Assess the human resources and development potential.
2. Develop a fund raising team which includes staff, board, volunteers, and members.
3. Utilize the "strategic framework" process, which includes: time frame, market evaluation, assessment of critical needs, necessary products and services, and the competitive edge.
4. Become familiar with legal parameters such as IRS, tax laws, etc.
5. Develop, integrate and separate operational, capital, and endowment budget components.
6. Create a donor recognition plan.



Funding Evaluation Criteria:

1. Does the fund raising team have well established goals for operational, capital and endowment development?
2. Are individuals assigned the responsibility to meet the goals?
3. Is there a time frame established for completion?
4. Does the director oversee the fund raising team's activities to ensure the expected level of performance is met?
5. How much money and in-kind services have been raised?

Funding Goal III

To identify and implement annual funding priorities.

Funding Guidelines:

1. Project needs, costs, and operational budget.
2. Review funding sources.
3. Develop literature.
4. Cultivate funding sources with special events.
5. Identify and develop partnerships.
6. Involve and educate.

Evaluation Criteria:

1. Is there a written funding plan for the financial goal, and a budget for raising it?
2. Is there a listing of existing sources of funds and amounts, giving a history of individual and organizational donors?

3. Is there a case statement that includes the purpose of program and needs? Is there a brochure, program statement, and financial report?

4. Is there a calendar of events such as cocktail parties, boat cruises, dinners, etc?

5. Is there a list of potential new sources of funds with a calendar of contacts and possible donation amounts?

6. Is there a work plan listing activities, schedules, and expected outcomes?

Funding Goal IV

To develop a long range strategic plan that will address the future of the organization in terms of its mission: "Who are we? What do we want to be? How do we become that?"

Funding Guidelines:

1. Establish a time line for the creation of your strategic plan.

2. In writing the plan, address the organizations vision, mission, goals, objectives, and budgetary constraints.

4. Draw out your organizational chart showing how various functions and people relate to one another.

5. Involve both the staff and board of directors in developing the plan.

6. Publish a strategic plan document.

7. Review and revise the plan annually.

Funding Evaluation Criteria:

1. Is there an agreed upon timetable for planned preparation?

2. Does a detailed planning document exist?

3. Is there evidence that the staff and board have ownership in the plan?

4. Do staff and board understand your organizational hierarchy?

5. Is the strategic plan used in any way as a development tool?

6. Are annual revisions of a plan available?

Funding Goal V

To develop a long range funding plan that is tied to an organization's mission statement and strategic goals.

Funding Guidelines:

1. Customize the plan to the location, people and situation.

2. Establish priorities within the plan.

3. Establish a development committee or designate a development responsibility.

4. Consider the use of outside consultants.

5. Develop a comprehensive public relations plan.

6. Consider the creation of a "friends" committee or association.

7. Develop professional promotional materials as part of the public relations plan.

8. Develop a sophisticated planned-giving program.

9. Solicit major gifts.

10. Create a retail sales operation.

11. Do an annual review and update of your plan that involves staff, trustees, and community. This review should examine trends in giving as well as competition for identified funds.

Funding Evaluation Criteria:

1. Is there a funding plan that clearly reflects specificity to the local situation?

2. Have priorities been assigned a ranking number?

3. Are responsibilities for development identifiable?

4. Do records show the use of consultants or the reasons they were not obtained?

5. Is there a written public relations plan?
6. Have "friends" groups been identified, or do records show discussion of decision not to pursue such groups?
7. Are promotional materials readily available?
8. Does a planned-giving program exist? Is information about it available?
9. Does a retail sales operation exist, and if so is it profitable?
10. Is the annual plan revision available?

Funding Goal VI

To ensure a diversity of programs and funding sources. Organizations frequently become comfortable with a basic funding source such as a grant or a tax allocation. This places that organization in jeopardy in the event of a change in the financial or political climate. The "dependable" grant from a local industry may dry up when that business faces hard times or a change in their priorities. Creating a broad base of funding sources gives the nature center a safety net. It also ensures that you are not asked to compromise your philosophical beliefs in order to continue to receive funding from a source that may be trying to influence your decision making.

Funding Guidelines

1. Conduct donor research. Become familiar with prominent individuals, organizations, and businesses in your community. Know their giving patterns and "interests."
2. Seek out new markets, new members, and create new fund raising events. Contact other centers to discover what sources and events have worked well for them, and evaluate whether they could be adapted to your situation. Document and publicize your own success in order to attract new members. Ensure that quality programming occurs consistently. Make sure that all staff members realize that they are your front line. They have the contact with the public, and the ability and responsibility to attract new membership. Promotion of your facility needs to be an integral part of staff orientation, and not an afterthought to programming.

3. Develop a process of program evaluation and accountability. Your master plan for any new programming should include a plan for evaluating costs, content, and amount of staff time needed for each program.

Funding Evaluation Criteria:

1. Does your organization maintain a card file of potential funding sources and their "profiles?"

2. What percentages are represented by each funding source? Is there a balance among big donors, grants, sales, programs, membership, donated materials, equipment and time?

3. Is your membership growing?

4. Is there repeat participation? Do participants go on to sample other programs?

5. Are there opportunities to gain further experiences, or is all programming on the same level?

6. Does your board represent a broad base of political and financial power in the community?

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EDUCATION GOALS & GUIDELINES

Education Goal I

To make services personally relevant.

Education Guidelines:

1. Where possible, focus programs and services on local and personal issues. People have a natural interest and motivation to learn about issues that directly affect them. Use these as jumping off points to teach about nature and the environment.

2. Promote the idea that environmentally sound lifestyles need not be complex or difficult by making programs and services fun, exciting, socially relevant, and convenient.

Education Evaluation Criteria:

1. Do program listings or curriculum courses listed promote personal relevance?

2. Are you using current educational materials and do they address contemporary issues?

3. Does the emphasis of programs, displays, services, etc., reflect personal awareness and appreciation of natural subjects?

4. Does the organization employ the techniques and philosophy of personal relevance in its programs and services?

Education Goal II

To identify audiences who participate in nature center programs, visit the center's facilities, or utilize the trails and determine their needs.

Education Guidelines:

1. Identify repeat visitors.

2 Survey similar program providers to avoid duplication of efforts.

3. Survey potential users to determine their needs in nature center programming.

4. Review existing school curricula to match nature center offerings with school needs.

5. Develop instruments to gather this information.

Education Evaluation Criteria:

1. Are there records that indicate who is using the center's programs?

2. Is there a record of annual meetings with representatives from school districts to discuss changes and additions to their curriculum?

3. How and when was community input gathered to identify changes in types of interests that may affect program participation and, consequently, offerings?

Education Goal III

To meet the educational needs of the area.

Education Guidelines:

1. Assess what the educational needs are by surveying user groups and conducting demographic analysis.

2. Determine requirements that teachers and others must adhere to, eg., limitations, constraints, standards, guidelines. Tailor program packages to recognize requirements.

3. Find out what curricula are available. Gather state and other curriculum guidelines and assess; decide which is appropriate, and train nature center staff in use of curriculum.

4. Establish committees representative of full community.

Education Evaluation criteria:

1. Are surveys designed, delivered, and statistically representative of users analyzed?

2. Are community demographics analyzed, plotted by percentage, and the numbers placed on a map?

3. Have local and state education requirements been obtained, analyzed, and evaluated in terms of how your program addresses them?

4. Have you received input from administration and teachers to find out how your program can contribute to requirements?

5. Are new program packages submitted to administration and teacher representatives for review prior to full implementation?

6. Are usable curricula identified and incorporated into program?

7. Is there evidence the nature center staff uses the curriculum?

8. Have community based advisory committees been selected?

9. Have committees participated in the process of developing or revising the education program?

10. Have user groups been surveyed to see whether programs reflect their needs?

11. Has demand for programs been assessed? Is there a change in the rate of return of various users?

Education Goal IV

To promote, market, implement and evaluate programming.

Education Guidelines:

1. Develop a marketing plan that reflects an understanding of the markets you have chosen.

2. Include in the marketing plan the establishment of personal relationships with the media, perhaps through a PR advisory committee.

3. Effectively use your human resources including volunteers and staff. Each individual needs to be properly rewarded in order to maintain quality work.

4. Maintain an ongoing evaluation and revision system. Top quality programs will continue to enhance the success of each nature center.

Education Evaluation Criteria:

1. Has the nature center identified and defined its market?

2. Has a marketing plan been developed?

3. Has a public relations advisory committee been established and a

system to maintain personal contacts with the media been put in place?

4. Do you have a fair and honest system to define jobs, hire, set objectives, evaluate and compensate staff and volunteers?

5. Do you have formal and informal systems to evaluate educational programs, and a system to revise programs as needed?

Education Goal V

To make the nature center fun and a place people want to be.

Education Guidelines:

1. Develop a sense of ownership by teachers, colleagues, and children.

2. Aim to make teachers, care givers, and parents comfortable with science and the outdoors.

3. Provide public recognition for participants.

4. Provide convenient scheduling of programs.

5. Provide your clientele with opportunities to meet people and develop friendships.

Education Evaluation Criteria:

1. To what degree can you identify your clientele?

2. Are teachers, colleagues and children asking you for programs?

3. Do you have a record of attendance of programs, noting the degree of return visits?

4. Do you have a scrapbook or other evidence of publicity, and group recognition of participants?

5. Do you have a calendar of events and activities designed to help develop friendships?

Education Goal VI:

Develop a master plan for programs tied to the mission statement and goals of the organization.

Education Guidelines:

1. Develop a financial plan that supports the education program and staff.
2. Consider the the long term effects on the fincancial plan when selecting education programs.
3. Develop a curriculum that: addresses your audience , reflects your mission statement, considers available materials, is site specific, and has an evaluation process.
4. Provide a timetable for implementation which includes assessment of need, review of material, writing, field testing, evaluation and printing.

Education Evaluation Criteria:

1. Can all of your educational activities be justified by the mission statement?
2. Is there a correlation chart that shows how each educational activity connects to the mission statement?
3. Is the financial cost of a program justified by its positive impact on the budget, or by its priority within the goals and objectives?

Education Goal VII

To develop an educational mission statement.

Education Guidelines:

1. The mission statement should be developed by a group process involving trustees, staff, other volunteers, teachers and other user groups.

2. Once there is a consensus, the mission statement should be formally adopted by the Board of Trustees, and communicated throughout the organization.

3. Focus the mission statement to appeal to community (groups, families, individuals) by making the organization's programs relevant to their personal lives and to future generations.

4. Make the mission statement a visible part of your daily operation.

Education Evaluation Criteria:

1. Is the mission statement concise?

2. Is it focused, especially to daily living, planning for the future, and dealing with the local environment and environmentally sound lifestyles?

3. Is there evidence that it is inclusive of all segments of society in the region served?

4. Can everyone in the organization verbalize the mission statement?

Education Goal VIII

To provide consistently high quality programs.

Education Guidelines:

1. Hire well qualified staff and evaluate their performance.
2. Evaluate and modify all programs to keep them up to date and of the highest quality.
3. Network with other providers to eliminate unnecessary duplication.
4. Acknowledge the efforts of those involved.
5. Support as important elements , teacher training and the production of education materials.

Education Evaluation Criteria:

1. Do you maintain a file of evaluation forms as completed by class participants?
2. Can you describe the means by which staff and volunteers are acknowledged and rewarded for their efforts?
3. Do you have literature on file from all institutions in the community to see how your programs complement or reinforce other community-based programs?
4. Do you have a chart showing where you connect to other providers in conducting your education program?
5. Do you have printed copies of teacher training programs and materials?

Participant Notes

Norman L. Brunswig, Harleyville, SC, is Assistant Director of Sanctuaries for the National Audubon Society and manager of the Frances Beidler Forest, National Audubon Society. A native of Rock Island, IL, he holds degrees from Auburn and the University of Georgia in Wildlife Management, Wildlife Ecology and Forestry. Norman has had wide experience in field projects including evaluating channelized streams, environmental impact of the Spewrell Bluff Dam on the Flint River of Georgia, and evaluation of potential natural landmarks for the Department of the Interior.

Robert E. Budlinger, Albany, NY, is Director of the Bureau of Environmental Education for the New York State Department of Environmental Conservation. A graduate of Cornell University, he has past experience as a nature center director, as a USNP ranger-naturalist, and as a secondary science teacher. He is currently president of the New York State Outdoor Education Association. He is also on the Board of Directors of the National Association for Interpretation and is Vice President of Programs for the Governor Clinton Council of the BSA. He is a life-long birder. His most recent awards include The Leadership Award for the NYS Outdoor Education Association, and Conservation Educator of the Year from the NYS Conservation Council, NWF affiliate.

Marshal T. Case, Sharon, CT, is Vice President for Education of the National Audubon Society. A graduate of Cornell University, he is also on the Board of Directors of the Hummingbird Cay Foundation, is Chairman of the Board of the Ballona Living Museum in California, and is a Fellow of the Explorers Club. Among his recent awards are the Gold Medal from the Natural Science for Youth Foundation, and the National Audubon Society's Carl Buchheister Award. He has designed and built two nature centers and has organized fourteen Audubon Society chapters of the National Audubon Society. He is the developer of "Audubon Adventures," one of the largest youth conservation clubs in today's world.

Kathy Stiles Cooley, Birmingham, AL, is Executive Director of the Nature Conservancy of Alabama. She is the founder and past director of the Ruffner Mountain Nature Center in Birmingham. She is also founder and board member of the Alabama Hiking Association, a girl scout troop leader, and board member and secretary of the Natural Science for Youth Foundation. Her awards include the 1984 Conservationist of the Year Award by the Alabama Conservancy. She is also a recipient of the Elsie M.B. Naumburg Award by the National Science for Youth Foundation.

James Davis, Portland, OR, is Education Director for the Audubon Society of Portland. He holds degrees from Colorado State University and UC Santa Barbara. He was formerly a secondary and science teacher and education specialist at two zoos.

Charity Krueger, Dayton,OH, is Director of Aullwood Audubon Center and Farm. A graduate of the University of Toledo with a graduate degree from the University of Michigan, she has experience as a former Natural Resources Instructor at the Agriculture Education Center in Toledo, OH, as Director of theYouth Conservation Corps Program, Ottawa National Wildlife Refuge (OH), and as an interpretive specialist. She is the regional chair of the Southwest Ohio Earth Day 1990 celebration. She is recipient of "Conservation Educator of the Year" award from the Ohio League of Sportsmen. She is a member of the advisory board for the Ohio Department of Natural Areas and Preserves.

Mike Link, Willow River, MN, is Executive Director of the Audubon Center of the North Woods and the International Wolf Center. He holds a graduate degree in Environmental Education from St. Cloud College and has been on the faculties of Northland College and Metropolitan State University. He is author of eleven books, is a national lecturer and consultant and has had extensive experience as a fund raiser.

Michael Long, Pasadena, CA, is Natural Areas Supervisor for the Los Angeles County's Eaton Canyon Nature Center. He holds a degree in Zoology from UCLA and manages programs at three county natural areas and eight desert wildflower sanctuaries. He is on the Board of Directors of the Pasadena Audubon Society, and is the Rare Plants Chairman of the San Gabriel Mts. Chapter of the California Native Plants Society.

Jenepher R. Lingelbach, Woodstock, VT, a Vassar College graduate, is Director of Education for the Vermont Institute of Natural Science. She is editor of VINS' nationally acclaimed book *Hands on Science.* She has been recognized as an outstanding teacher by the Vermont Department of Education. Her articles have appeared in *Nature Study, Science and Children, Journal of Interpretation,* and Phi Delta Kappa's Exemplary Practice Series *Outdoor Education.* She has presented programs for TI-IN satellite TV Network in San Antonio, the National Science Teachers Association, the American Association of Environmental Educators, and the National Science for Youth Foundation. In 1985 she was selected to attend the NSTA Honors Workshop for Elementary Science Teachers.

James M. Malkowski, West St. Paul, MN, is Executive Director of the Dodge Nature Center. He holds degrees from the University of Wisconsin and the University of Nebraska. His professional experience includes work as a naturalist for the City of Omaha, and Founder and Executive Director of the Fontenelle Forest Nature Center. He is Regional Director - Midwest Region of the Natural Science for Youth Foundation. He has served on the Board of Directors of the Association of Interpreters and Naturalists, and as President of the National Association of Interpreters. He also teaches college courses on mammals and birds.

Larry D. Richardson, Bay Village, OH, is Director of the Lake Erie Nature and Science Center. He holds a degree in Wildlife Management from Ohio State University. He is a nature columnist for a weekly newspaper,Westlife. His memberships include the Technical Committee of the U.S. EPA Cuyahoga River Remedial Action Plan, the Northeastern Ohio Inter-Museum Council, and the Ohio Conservation and Outdoor Education Association.

Michael Riska, Hockessin, DE, is Executive Director of the Delaware Nature Society. He holds a graduate degree in Natural History from the University of Delaware. He has had successful experience in large capital campaigns. His honors include recipient of the 1987 national "Take Pride in America" award and Institute of Museum Services Grants in both 1988 and 1989.

Willard M. Rose, Kalamazoo, MI, is Executive Director of the Kalamazoo Nature Center. He holds a Ph.D. in Plant Ecology from Michigan State University. His scientific interests include forest ecology, natural areas management, and natural disturbance in the ecosystem. Past positions include South East Regional Director of Stewardship - The Nature Conservancy, Research Specialist for Michigan Natural Features Inventory, and Instructor at the University of Michigan.

Maurice "Skip" Schwartz, Stinson Beach, CA, is the General Manager of the Audubon Canyon Ranch. He is recognized throughout the San Francisco bay area as a science, nature and people enthusiast. His background is in the building trades and he has been a key part of every aspect of the highly acclaimed Audubon Canyon Ranch program from construction to education, to management of its operation.

Debbie Tewell, Colorado Springs, CO, is an interpreter with the El Paso County Park Department. She holds a Bachelors degree from Western State College in Gunnison, CO, and an M.S. in Environmental Interpretation from Colorado State University in Fort Collins. Besides her current position, she has served as an interpreter with the Vail Nature Center in Vail, CO. She has also taught at the Cloud Ridge Naturalists Field Seminars, at San Jose State University and at Pikes Peak College. She is currently Regional Secretary for the National Association for Interpretation, a member of DOVIA, is on the Board of Directors of Cloud Ridge Naturalists, and has been chapter officer for the Western Interpreters Association.

Robert A. Thomas, New Orleans, LA, is Executive Director of the Louisiana Nature and Science Center. He holds a Ph.D. in vertebrate zoology from Texas A&M University. He is adjunct professor at the University of New Orleans and Tulane University. He is chair of the Environmental Advisory Committee for the Strategic Petroleum Reserve, serves on the Board of the Chamber of Commerce, is active in civic and local affairs and writes a weekly nature column. He is currently Vice President of the Association for Nature Center Administrators. Honors include Conservation Educator of the Year in Louisiana and the Elsie Naumberg Award of the Natural Science for Youth Foundation.

Thea Ulen, Weslaco, TX, is Executive Director of the Lower Rio Grande Valley Nature Center, an environmental education facility founded in 1984 to preserve South Texas' unique and vanishing wildlife. She has been an important part of an outstanding development program at the center. She holds a degree from St. Olaf College in Northfield, MN and formerly served as Outdoor Recreation Services Supervisor for Hennepin Parks (MN).

Janeece Webb, Paradise, CA, is Coordinator of Altacal Audubon Society's Chico Creek Nature Center. She holds teaching credentials from the State of California for general secondary and community college teaching. She has twenty years experience managing nature centers.

James H. Wilson, Jefferson City, MO, is Natural History Administrator for the Missouri Department of Conservation. He holds an undergraduate degree in Biology from Northeast Missouri State and a Ph.D. in Plant Ecology from Iowa State University. He taught in colleges in Michigan and a field station in Colorado before joining the Missouri Department of Conservation as the Endangered Species Coordinator, a position he held for ten years. As current head of the Natural History Section he is responsible for the coordination of nongame, endangered species, natural areas, urban biology, and interpretive activities for the MO Department of Conservation. He oversees the operation of two major nature centers while a third is under construction.

Geographic distribution of confab participants

Acknowledgements

by William L. Sharp

My first major task upon joining RTPI as Director of Education was to organize and coordinate the confab for nature centers. I could not have done it without the help of many people from coast to coast. Judging by the generosity and enthusiasm received, I can see that the nature center field has no shortage of outstanding positive people.

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